

Factor each polynomial completely. If the polynomial is prime, so state.

13. $8a^3b - 12a^4b^2$ $4a^3b(2-3ab)$

14. $c^2 - 100$ $(c+10)(c-10)$

15. $y^2 - 16y + 64$ $(y-8)^2$

16. $75n^2 - 3n$ $3n(5n+1)(5n-1)$

17. $a^3 + 7a - 18$ prime

18. $xy - 6 + 2y - 3x$ $(y-3)(x+2)$

19. $81t^4 - 16u^4$ $(9t^2+4u^2)(3t+2u)(3t-2u)$

20. $27 - t^3$ $(3-t)(9+3t+t^2)$

21. $6n^2 - 5n - 21$ $(3n-7)(2n+3)$

22. $30u^2 - 8u^3 - 27u$ $-u(2u-3)(4u-9)$

23. $(x+3)(2x+5) - (x+3)^2$ $(x+3)(x+2)$

24. $a^4 - 10a^2 + 9$ $(a+3)(a-3)(a+1)(a-1)$

25. $x^5 - 256$ $(x^2+16)(x^2+4)(x+2)(x-2)$

26. $a^9 + 512$ $(a+2)(a^2-2a+4)(a^6-8a^3+64)$

27. $15n^3 + 16n^2 - 7n$ $n(5n+7)(3n-1)$

28. $12x^2 - 15 + 11x$ $(4x-3)(3x+5)$

Find the solution set of each open sentence.

7. $(x-2)(x+1) = 0$ $\{-1, 2\}$

8. $(x+2)(x-4) = 0$ $\{-2, 4\}$

9. $x^2 - 4x - 5 = 0$ $\{-1, 5\}$

10. $3y^3 = 27y$ $\{-3, 0, 3\}$

11. $m^4 - 81 = 0$ $\{3, -3\}$

12. $c(c+1) = 12$ $\{3, -4\}$

13. $(x+2)^2 + (x-2)^2 = 40$ $\{4, -4\}$

14. $2t^2 - 10 = t$ $\{-2, \frac{5}{2}\}$

15. $(6t-7)(t+2) = -10$ $\{\frac{1}{2}, -\frac{4}{3}\}$

16. $x^2 - 16 = 0$ $\{4, -4\}$

17. $c^2 = 2c + 15$ $\{-3, 5\}$

18. $u^3 + 3u^2 = 10u$ $\{-5, 0, 2\}$

19. When each edge of a cube is lengthened by 3 cm, the volume is increased by 1413 cm^3 . What is the length of an edge of the original cube? 11 cm

$x = \text{edge of cube}$

$x+3 = \text{edge of new cube}$

* $(x+3)(x+3) = x^2 + 6x + 9$

$(x+3)(x^2 + 6x + 9) = x^3 + 6x^2 + 9x + 3x^2 + 18x + 27$

$(x+3)^3 = x^3 + 1413$

* $x^3 + 9x^2 + 27x + 27 = x^3 + 1413$

$9x^2 + 27x - 1386 = 0$

$x = -14$

$9(x^2 + 3x - 154) = 0$

$x = 11$

$9(x+14)(x-11) = 0$

27. The sum of two numbers is 20. The difference of their squares is 120. What are the numbers?

13 and 7

28. The longer leg of a right triangle is 4 cm more than four times the length of the shorter leg. The hypotenuse is 1 cm longer than the longer leg. How long are the sides of the triangle?

9 cm, 40 cm, 41 cm

27. $x, 20-x$ are the numbers

$x^2 - (20-x)^2 = 120$

$x^2 - 400 + 40x - x^2 = 120$

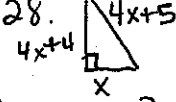
$40x = 520$

$x = 13$

$x^2 - (400 - 40x + x^2) = 120$

$(x-9)(x+1) = 0$

$x = 9 \text{ or } -1$



$x = \text{shorter leg}$

$x^2 + (4x+4)^2 = (4x+5)^2$

$x^2 + 16x^2 + 32x + 16 = 16x^2 + 40x + 25$

$x^2 - 8x - 9 = 0$